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ABSTRACT

This report is based on the work of the international colloquy organized by the Council of Europe (Luxembourg, 1981). The aim of the colloquy was to explore how to foster an outward-looking approach in schools, and how to bring about a new approach to teaching man/environment relationships and ways in which people affect and are affected by their surroundings. The report contains a summary of introductory statements, four selected case studies, and some considerations on the need for a new spatial design for schools. Topics addressed in the introductory statements include the utilitarian function of schools, the teaching need for open schooling, and the educational function of open schooling. Case studies focus on educational projects which effectively incorporate the environment at all educational levels. These include projects from the United Kingdom (environmental responsibility/awareness), Spain (urban pollution and its effects on plants), Denmark (introduction to working life), and France (establishment of land-use plan and practical application). Whether the new outward-looking approach to teaching should or should not influence the design of school buildings is addressed in the final section of the report, suggesting that educational teams express their needs in the form of a program for architectural considerations. A sample program is outlined and discussed. (JN)

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AN OUTWARD-LOOKING APPROACH IN SCHOOLS

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STRASBOURG
1982

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EUROPEAN COMMITTEE FOR THE CONSERVATION
OF NATURE AND NATURAL RESOURCES

AN OUTWARD-LOOKING APPROACH IN SCHOOLS

prepared by

Sten Krog CLAUSEN
Foundation for Environmental Education in Europe

COUNCIL OF EUROPE
1982

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INTRODUCTION

This report, which has been prepared by the Foundation for European Environmental Education, is based on the work of the international colloquy organised by the Council of Europe in Luxembourg from 17 to 19 September 1981.

"The changes that have affected and continue to affect our cultural, economic and social lives, call for a far-reaching effort of adjustment on the part of the education system. As modern technologies develop and manufacturing methods change, as patterns of working life and family life are transformed and new lifestyles evolve, as conventional values come under attack or change, there will inevitably be considerable repercussions on our schools and their place in society."

The aim of the Luxembourg Colloquy, which brought together some 60 or so experts from 15 countries, was to explore how to:

- foster an outward-looking approach in schools, and

- bring about a new approach to teaching man/environment relationships and the ways in which people affect and are affected by their surroundings.

This report contains a summary of the introductory statements, four selected case studies and some considerations on the need for a new concept of schooling.

The debate on how to achieve this new relationship between school and society is by no means over. We hope that this publication may contribute to it and thus fulfil its main purpose, which is to encourage an exchange of views between educationalists, architects and administrators.

EXTRACT FROM THE INTRODUCTORY SPEECH by Mr F BODEN,
Minister for Education, Grand Duchy of Luxembourg

"On behalf of the Government of the Grand Duchy of Luxembourg, I should like to thank the Committee of Experts for Environmental Education and Training of the Council of Europe for having chosen our country as the venue for this international colloquy.

The presence of this audience and of the press at the colloquy is sure to awaken the interest of the public, and especially of all those who hold positions of responsibility in the field of education.

Long confined between four walls and detached from society, schools are gradually adopting a more outward-looking approach, broadening the field of their activities and making studies more lively and more practical. This new trend, however, implies a much greater commitment on the part of teachers, a greater awareness of the outside world, a spirit of initiative and co-operation with representatives of the public and private sectors as much as with other teachers.

The preparatory work for the colloquy showed clearly that there was no single approach and that the possibilities are as varied as the subject-matter to be taught and the people concerned, whether students, teachers or outside helpers.

All the work displayed on this occasion is aimed at illustrating the same purpose, namely to encourage children to think about the problems around them, to express their opinion, to learn how to discuss with others, to work in groups and to become more responsible.

Whatever the topic used, whether it be the problem of litter, waste and pollution, introduced by the United Kingdom, the use of energy as seen by the United States representatives, the introduction to working life presented by Denmark or the account of the survey and restoration of a site in France, in each case, as André AULIAC wrote in LE MONDE on 10 September 1981, it is 'the child who is at the centre of the debate. He constitutes the main, if not the sole objective. He must be instructed, educated, trained, made to understand himself, fulfilled for his own sake and for his future'.

Even though the attitudes of adults are not so easy to change as those of children, I feel sure that the compared experience, the contact and the exchange brought about by the colloquy will provide an opportunity for us to reconsider our behaviour and to achieve a better understanding of our own problems.

..."

SUMMARY OF THE INTRODUCTORY STATEMENT

by Mr J GOURLAOUEN,
Inspector-General for Education (France),

President of the Colloquy on
"An Outward-Looking
Approach in
Schools"

How do schools react to the modern world?

What does environmental education have to contribute?

There have been considerable changes in social and family structures, modes of behaviour, styles of life and traditional values as a result of industrial and commercial development and the high rate of urbanisation this has brought about, and as a result of the explosive growth of technical means of expression and communication.

As this transformation has occurred, the structure of schools has gradually hardened and teachers, parents and students have combined to resist a change which we are now beginning to see is necessary.

Such an attitude of "self-defence" is increasingly difficult to maintain. Schooling is no longer a closed area, isolated from the influence of its surroundings.

In view of the potential dangers involved, the partners of the educational system now agree on the need for "an outward-looking approach in schools".

Outward-looking for the sake of utility.

Outward-looking for the sake of teaching.

Outward-looking for the sake of education.

These are the three main lines of thought we should like to explore.

The utilitarian function of schools

Young people are the producers and consumers of the future. Schools must prepare them for working life and must therefore adopt an outward-looking approach to the world.

This open outlook concerns not only young people, but also teachers, who are often cut off from other types of activity in the country.

In order to facilitate the choice of careers, by providing information on possible outlets in an increasingly tight labour market, schools must bring students into contact with the working world, awaken their interest and help them choose. Schools must put young people in touch with the realities of life in society, by illustrating the often abstract material presented in the classroom.

Training courses in firms, projects and visits can make young people acquainted with the economic and social framework of their future activity, which may still be uncertain. This outward-looking approach to employment by schools will furthermore be related to a particular political and social setting, towards which all mistrust and reticence must be overcome.

Young people, who are consumers directly through their own purchasing power and indirectly through their influence over family purchases, will increase their consumer activity when they become independent. This preparation for everyday life used to be provided by the family, but is less and less so, while it is increasingly influenced by fashions encouraged by the media.

Linking knowledge and know-how, schools must awaken their students' interest in general economic problems as well as in everyday problems, so that, once they are aware of them, they may discover the causes and may learn to defend themselves and to overcome difficulties, to make reasoned choices and to resist certain enticements.

The teaching need for open schooling

The basic purpose of schooling is to inform by transmitting knowledge.

However, the teacher is no longer the sole repository of knowledge and school is no longer the sole channel of transmission. The role of the school as a means of teaching must therefore be reconsidered, just like the role of the teacher as the dispenser of knowledge. No one nowadays, whether teacher or pupil, can master all the knowledge available in a particular discipline.

The function of schooling has evolved. It used to transmit a ready-structured form of learning, but its task nowadays is more to restructure knowledge, the greater part of which has often been acquired elsewhere.

The institution of schooling can no longer act as a haven of peace, a sanctuary, a screen between the outside world and youth. It should instead act as a relay, in which teachers play the part of intermediaries.

Although at first it appeared to be nothing more than a means of relieving the lack of interest and boredom of abstract study, the outward-looking approach is now causing an upheaval in teaching practice.

Concrete situations, actually experienced by the child, are used as a basis for observing and analysing facts, in order to interpret and understand them.

This sequence of rational steps will naturally lead to the discovery of laws and the formulation of abstract notions and concepts.

Only the most outward-looking approach can offer the necessary practical setting and the teacher will naturally be led to take his students to observe the events of everyday life wherever they actually take place.

The astounding development of the means of communication and information, which has freed us from time and space constraints, means that the teacher

- should not let himself be overwhelmed by the quantity of information delivered in a very short period of time;

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- should himself learn how to teach others the best way of selecting and taking in new information, and transmitting it in the form of coherent knowledge.

The increase in the scope of teaching, which has resulted from the diversification of the means available, has rendered the traditional teacher's discourse obsolete.

Only an open form of teaching, linking action and reflection, master-pupil and pupil-pupil relationships, group work and individual work, can suitably replace "lessons" in class and enable both teachers and pupils to derive the greatest benefit from an outward-looking approach to life.

Educational function of open schooling

Besides their task of transmitting knowledge and skills, schools also have an educational function and should encourage students to develop certain types of behaviour and ability.

There are many educational objectives, such as self-expression, hard work creativity, independence, a critical mind, self-respect and respect for others, flexibility and a sense of responsibility, for which new teaching methods are not necessarily required.

The educational quality of the outward-looking approach resides rather in the new attitude of the teacher, who will take every opportunity to discover and develop particular abilities, in the new type of situation which will arise, and in the new educational methods it encourages.

It is no longer necessary for everything to be memorised. People must learn to use technical aids and exploit their advantages. Schools should encourage the development of a critical sense, which will protect the individual's freedom of thought and action and provide him with the means of living and building the world around him - his world.

If they are open to the outside world, schools can bring students to discover, know and understand it. This new objective is related not to any particular discipline or teaching method, but to teaching as a whole, in a spirit of consultation and co-operation.

The practical aspects of the outward-looking approach in schools still remain to be determined. The teaching profession is changing and perhaps the time has come also for outsiders to change their attitude towards schools. Perhaps the true purpose of schools is to become centres of culture and activity accessible to all. If so, their position, buildings, facilities and rules would need to be reconsidered.

Open on the world, but at the same time open to everyone, schools should help reconcile people with their environment, at a time when increasing technical sophistication is giving rise to a desire for greater simplicity.

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Conclusions

"In the new world which is ours, which is already and will be even more so in the future the world of our children, in this fragmented world, with its over-abundance of information and the increasingly invading presence of the media, the need for education is greater than it ever has been before. How can we best equip our children to cope with the problems of our time?

It is this thorough preparation of his whole being which enables the individual to act instead of being acted upon, to undertake and master instead of accepting and defending, and it is this organised learning which is the key to all understanding and action and which is produced by the combination of method and analysis in different disciplines ..."

The aim of any real environmental education is above all to develop a responsible form of behaviour, which means inculcating in students two fundamental attitudes: a spirit of observation and the will to understand.

Environmental education should place substantial emphasis on the independence of students. It should take account of their initiatives, awaken their curiosity and develop their sense of objectivity. It should lead to a wish to understand the mechanisms which maintain the equilibrium of living environments. It should be able to show how dependent Man is on his environment and the risks involved in disturbing its balance.

The wish to observe, the ability to understand and the desire to act constitute both the aims and the stages of environmental education.

Students are the main actors, while teachers play a fundamental part in helping them to acquire knowledge and working methods.

Knowledge is indispensable. The absence of accurate knowledge can only lead to irrational, inapplicable and ineffective planning. Education cannot be dissociated from teaching and teaching must be adapted to the development of students and take account of the type of study undertaken.

The environment in which we live is a complex reality, made up of many interrelations. It is the natural, physical and biological environment which surrounds us and which is conditioned by us.

The human environment, made up of our relationships with others and our response to social and psycho-sociological factors.

The technological environment (or world), with its effect on our daily lives, our ways of living and thinking.

The imaginary environment, made up of all the intellectual and artistic creations of Man since the beginning.

The cultural and ideological environment.

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All these make up a system whose "balance is determined by the actions and reactions of component factors, by the network of interrelations linking and sustained by objects and living beings, and by the visible or invisible rules which govern it".

Educational environment is a means of acquiring an awareness of problems arising from the balances or imbalances of a particular environment, or, in more general terms, of the relations of interdependence between Man and that environment.

It is a means of gaining awareness of Man's place in the biosphere, the acknowledgement of his reponsibility and the recognition of his power to act.

PRESENTATION OF CASE STUDIES

For our account of the colloquy's work, we have selected reports on four new educational experiments, which incorporate the environment very effectively in education at all age levels.

"School and the natural environment": for pupils aged 4-14.

UNITED KINGDOM: Environmental responsibility and awareness - project co-ordinator: Mrs Cherry Mares.

SPAIN: Urban pollution and its effects on plants - project co-ordinator: Mr J S Moro.

"School and working life": for pupils aged 14-16.

DENMARK: Introduction to working life - project co-ordinator: Mr Willy Daniel.

"School and local life": for pupils aged 16-19

FRANCE: Establishment of a land-use plan and practical application - project co-ordinator: Mr Roger Maguer.

The choice of these topics shows how the notion of environment has been broadened to cover the whole framework of our lives, and that ecology is now a part of environmental education.

The way the experiments of these various countries have been presented is meant to encourage all those involved in environmental education, that is, educationalists, teachers and the public and private leaders of our society, to adopt an outward-looking approach in their schools and to practise a new form of teaching. The experiments are easy to follow and full details concerning the project co-ordinators are given at the beginning of each chapter so as to provide the reader with direct contact, should he wish to undertake a project in accordance with his own aims and constraints.

UNITED KINGDOM

Mrs Cherry Mares
Research Associate - Project co-ordinator
KEEP BRITAIN TIDY GROUP
Schools Research Project
BRIGHTON POLYTECHNIC
Grand Parade
BRIGHTON BN2 2JY

The KEEP BRITAIN TIDY Schools Research Project was started at the Brighton Polytechnic in 1973.

Its aim was to find ways of increasing children's sense of responsibility for their environment and their awareness of the litter problem.

The project is supported by the Department of the Environment, industry and private donations.

It is run by a group bearing the name of the project.

TEAM:

1 project co-ordinator
1 researcher
1 assistant
1 part-time secretary
1 Advisory Committee drawn from several faculties and departments of the Brighton Polytechnic, including computing and teacher training
Technical assistance provided by the Department of Education and Science, the Irish Education Council and the Scottish Department of Education.

In the early stages of the project, a general survey was made among local authorities, environmental groups, schools and colleges in the Brighton area and in other parts of Britain. In a questionnaire, teachers were asked to give an account of any teaching experiments which they thought had successfully increased children's sense of environmental responsibility and to indicate what learning material they thought should be used for this purpose.

Similar questionnaires were sent to educationalists in 22 areas, and to environmental groups known to have an educational interest. Local authority refuse disposal departments were asked to say what they thought should be taught, in and out of school, and to comment on any information they might provide.

The results of the survey were then used to identify the principles on which environmental education should be based. It should ideally be:

- long-term (need to co-ordinate and plan the development of the project continuously from the early years of schooling though each stage of education);

- multi-disciplinary (environmental education should make the broadest possible use of science, but also of general subjects and creative art work, with a view to inculcating automatic responses which will remain with the individual throughout his life);

- it should use the environment as a resource for learning (thus giving children an opportunity for direct, practical contact with the problems, and by means of suitable (self-made) learning material, encouraging personal experience, hence personal involvement, stronger motivation and better understanding).

At the same time, it appeared that the following qualities were necessary as far as the learning material was concerned. It should be:

- attractive (to guide and enliven teachers' search for and preparation of information, and to encourage them to undertake investigations and work outside their own personal specialisation);

- flexible and wide-ranging (to allow direct and induced teaching, facilitating access to different topics, through different references drawn from teachers' experience and the natural curiosity of children);

- informative (providing children with clear facts concerning the consequences of irresponsible behaviour, in terms of cost, physical deterioration, pollution and danger);

- audio-visual (drawing on the vast possibilities offered by audio-visual techniques and materials, so as to make learning a living and attractive experience);

- high-quality (competitive with commercially produced material, to which teachers and pupils are accustomed).

The material has so far been classified into three themes, selected by research teams in consultation with the teachers and advisers of a number of local public services in England, Scotland and Wales.

LOOK AROUND THE TOWN: for children of 4-7 years (1980).

Learning kit to develop children's understanding and awareness of the urban environment.

LITTER: set up in 1976 for children of 10-11 years, and in 1977 for children of 7-9 years, as a basis for practical work on litter and related problems in the local environment.

PAPER AND GLASS (1981, 12-14 years), designed for science teachers and their pupils, providing the information needed to understand the consequences of our way of life on the environment and to increase the sense of responsibility.

All these topics have the same general objective, which is to encourage children to work together on subjects which will develop a personal sense of responsibility (influence of the environment on daily social and cultural life), and to practise and extend the use of words.

INFANT AND PRIMARY SCHOOL RESEARCH

On the basis of the general principles described above, research was begun in 1977, for children in the 4-7 age group, to discover the particular needs of nursery school children and to design suitable material after analysing the initial reactions of teachers and pupils.

The working groups were taken from a variety of schools (in terms of position, size etc), all in England. They maintained regular contact and tried to identify:

- the basic knowledge required;
- the best ways of encouraging mathematics and language teaching using the theme of the environment;
- suitable science-related ideas and topics, to compensate for the lack of confidence of most nursery school teachers in their abilities to teach natural sciences.

IDENTIFYING THE NEEDS OF TEACHERS AND CHILDREN

At the end of 1978, after drafting a set of proposals regarding form and educational content, the study group sent out some 500 questionnaires to teachers to test their reactions.

The following main points emerged from the replies:

- priority to be given to the development of language skills (compared with writing, manual work, awareness of the environment and the problem of litter);
- neither teachers nor parents keen to devote much time to other work than the acquisition of language skills;
- suggestion to encourage oral discussion by showing pictures to small groups of children (improving observation, environmental awareness etc); children find it difficult, however, to relate what they see in a picture to their own lives;
- another suggestion: visiting the town in the neighbourhood of the school;
- science (properties of materials) and the rudiments of mathematics (statistical notes, measures etc) could begin to be assimilated as early as nursery school through observation of the environment;
- similarly, other topics could be introduced on the basis of the same type of work, such as the awareness of safety and danger, consideration for others, first approach to the possibility of reducing litter etc;

- learning material must be made very attractive, well presented in glossy, bright colours, if it is to hold children's interest;

- above all, material must not look "educational".

FIRST TEST OF MATERIALS

A first set of learning material was prepared and tested in a number of geographic areas in Britain.

Its three objectives were:

- in the long term, awareness of the immediate environment and other less familiar environments;

- identifying and evaluating the natural and artificial aspects of the environment, and their effects on the lives of individuals;

- appreciation of the interdependence between man and environment.

Material is designed so as to encourage practical work and discussion, to develop written and oral expression, both in the classroom and outside. It has been tested in 22 schools with over 1,200 children.

In the preparatory phase, the study group visited schools in order to observe the motivation of teachers. Later visits provided an opportunity to present material, discuss the methods of application and assess the results.

No strict instructions for use were given and on the contrary teachers were encouraged to be very flexible in adapting materials to their own methods and school background.

As the experiment did not include any activities specifically devoted to mathematics and science, teachers were asked in particular to give their views on the suitability of the materials for these subjects.

The test was held from April 1979 until the end of the summer, with some schools carrying on until the autumn term with projects relating to their home town. The study group visited each school at least twice and remained in constant touch by telephone and mail with all correspondents, and through exchange visits between schools and teachers.

LEARNING KIT

1. TEACHERS' NOTES

The aim of the notes is to give suggestions for using the kit, as a guide to teachers, so as to broaden the range of individual uses by increasing the teacher's interest. Many original suggestions were included in the final version of these teachers' notes.

2. POSTER

This is for display in the classroom and is designed to give rise to oral comments, as well as written exercises and manual work.

It took the form originally of a large poster in full colour illustrating many details to attract the children's comments and curiosity.

Topics illustrated on the poster are not listed, so as to leave children as free as possible to make their own interpretations and investigations.

A great variety of scenes are represented, taken from daily life in town, such as shop fronts and signs, town traffic and behaviour related to the Highway Code, people of different ages, disabled people, vegetation, people at work, market, litter removal and people carelessly discarding litter in the street, animals, station, bus stop etc.

The design work was carried out by an independent artist who is very accustomed to working with children.

Using the different scenes illustrated, after a general discussion about the picture as a whole, it is possible to get children to reconstitute individual scenes, then the chain of urban activity, in such a way as to encourage criticism of harmful attitudes, contrasted with services offered by the community, such as littering of public places and refuse collection; bad parking and public transport; a dog fouling a shop window and a shopkeeper cleaning up the mess etc.

At the end of the test period, the poster was completely redesigned and made so that it could be split into four parts, each illustrating a different subject.

Another version is provided in black and white for duplication and distribution to the children.

3. PICTURE CARDS

These were initially intended to provide vocabulary related to the posters, with very symbolic illustrations. The final design after user tests is a set of 20 illustrated dictionary cards. They are laminated (for toughness), printed in two colours (for economy), and illustrated with easily interpreted drawings (accompanied by very legible print).

4. WORKSHEETS

Designed to encourage writing and discussion, reading and comprehension. They also encourage an awareness of individual responsibility with regard to the environment (texts of game/exercises).

There are 10 worksheets for children in infant schools (learning to read and write). They can be used for writing, colouring, cutting, gluing, sequencing, mapping, and recognising natural and manufactured objects.

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Some puzzles encourage logical reasoning by their type of design and assembly.

5. WORK CARDS

Two sets, one red and one blue, of 10 cards each, one for beginners and one for fairly fluent readers. The cards are double-sided and arranged in order of difficulty. They encourage questions and answers, among the children themselves and between children and the teacher, using the picture, the written text or topic, logical sequences etc.

6. READING BOOKS

Two titles have been produced: "Tidy Man" and "Polly and Paul".

The first of these is concerned with the built environment of the town, the school, streets and parks, and emphasises the need for constant care and maintenance and the way everyone can help by being careful and considerate.

The second book draws children's attention to a few specific points concerning our environment. Its characters are two children, Polly and Paul, and animals. The story is particularly suitable for games, sketches and recitations.

7. PUPPETS

These are designed to encourage the use of language and imaginative games. The puppets (Polly, Paul, the dog, the owl, the dustman, the cat and the hedgehog) represent the seven characters of the book "Polly and Paul". They help even shy children to take part in the games, as each child will tend to identify with a character. They also encourage children to read the book.

There are two versions: glove puppets and finger puppets.

The glove puppets are printed on natural calico and are ready to cut out and sew. The finger puppets are printed in black and white on paper so that they can be duplicated in school and distributed to all the children.

8. GAME

The game was initially designed for adults and children. However, as teachers were reluctant to use it (in case they could not control it in class), it was left out of the final series.

At the end of the practical tests, some changes were made, either in the design of the objects or in their presentation. The reactions of the first pilot users were very rewarding and contributed substantially to the work of the study group.

The initial large poster was made into two friezes, one in colour and the other black and white (for reproduction), each consisting of four detachable parts which can be used in small work groups.

The illustrated word sheets became picture cards, or dictionary cards (in sets of 20 printed on both sides).

The set of worksheets was altered to allow for duplication in school.

The second book, "Polly and Paul", like the first, underwent considerable changes. The title, "Polly and Paul", became "Kate and Tim", partly for phonetic reasons, and to make the characters more modern, so that the children can identify more with them. "Tidy Man" became "Dustbin Day" and was finally withdrawn from the kit.

The seven puppets, which used to be ready-made, now come in two sets, one in calico and the other in paper for duplication.

The game has been withdrawn.

The general title of the material (sold in kits which differ according to the age of the children) has also been changed. The original title, "Me in the Town", has been changed to "Look Around the Town - First Steps in Understanding the Environment".

Preparing children for life in the community

Most of the teachers who use this type of learning material take children to visit the town, shops, parks or station. They encourage the children to criticise the amenities provided for the public in general, and not only those concerned with cleanliness.

The children have an opportunity to observe a bus shelter, public benches, telephone booths and anything which concerns or affects everyday life. They talk to shopkeepers and ask about the habits of customers. They ask pedestrians for their views on one-way streets or pedestrian areas. They study urban features such as public lighting, benches, advertising, litter baskets etc.

Thus, in the course of an outing, six-year-old children noticed that a major luxury store carelessly left evil-smelling refuse on the pavement. They also saw a tramp looking through a dustbin and picking out odd bits and pieces.

These two observations quickly led the children to enquire how the township was run and thus to learn about tax and rate collection and redistribution. They also talked at length about the homeless and poverty.

In this way, six-year-old children took an interest in their town and became aware of how it was run.

All these activities concerned with urban waste naturally lead children to want to know what it becomes once it has been collected. As a rubbish dump is perhaps not the ideal spot for a school outing, some schools may prefer to do without. As an alternative, firms specialising in waste treatment are willing to provide documentary films which are a useful way of informing children (urban heating etc). However, there are schools which have made such outings, and their reports show that it was possible to carry out interesting and lively work, even covering such topics as sewage treatment and incineration.

Improving the environment

Children who have taken part in these studies become very aware of the environment, feel concerned by its quality and often want to help improve it. This can be done in a number of ways, starting with planting a bulb in the school garden or the old people's home, and going on to large-scale cleaning operations and reforestation. In a number of places, where the authorities were discouraged because trees and bushes were regularly destroyed by vandalism, classes of children have helped replace the damaged plants. Vandalism was considerably reduced, one possible explanation being that older brothers and sisters hesitate to destroy the efforts of their younger brethren.

For the lowest age group, planting seeds in class, making a daily observation of germination and growth under variable conditions (of air, light, water, soil etc) and then replanting in the school garden can provide a worthwhile start to improving the environment.

Recent work for secondary schools

The research project was recently extended to secondary schools. Kits of learning materials were prepared for 12-14 year-olds, and support material will eventually be provided. The five main topics, paper, glass, metal, plastic and litter, give information about how the different materials are made, and provide an introduction to the physical sciences, technology and industrialisation. They also touch on the potential effects of industrial production and consumption on the environment. The emphasis is invariably placed on the importance of individual choice as far as environmental effects are concerned.

Besides producing support material for secondary schools, the study group has also been pilot testing a very new process, combining multi-disciplinary environmental education and language practice.

The project concerns children aged 14 working in bilingual groups in France and England. Their suggested topic is a comparison of man's influence over his natural environment in the two countries. A preliminary assessment of the method has brought out the following points:

- This approach is more appealing to children than traditional language practice.

- It facilitates the acquisition of a second language through more extensive vocabulary practice.

- It favours better memorisation of contact with the other country.

Examples of practical work on litter

Children (7-9 years) collect waste in the school playground and in selected dustbins, using plastic bags and gloves, and then sort it (into paper, plastic, metal, glass etc).

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For safety reasons, the youngest children may work with waste brought from home instead of collecting it on the spot.

- Mathematics practice:

  Weighing and measuring bags, recording the figures obtained on figures and graphs.

- Physics practice:

  The youngest children learn the main physical properties of materials by handling them.

- Science practice:

  Different tests of biodegradability, burying different types of waste and then making regular checks (daily or weekly) on how it changes.

  By extension, insight into what becomes of litter discarded in natural surroundings.

Introduction to the notion of individual responsibility

This notion can be inculcated in children at the earliest age.

One way is to encourage them to think about the school itself. The school caretaker can be asked to talk about his work. This never fails to interest young children, who like to watch and handle different tools and machinery.

They discover the unpleasant aspects of the job of cleaning and maintenance and naturally acquire an awareness of ways of facilitating the upkeep of the school.

The same can be done with rubbish collection at school. Children can meet the workmen involved and find out what their job is really like. They will learn, for instance, that such tasks can be made more pleasant or less dangerous if a minimum of care is taken by the public, for instance, if dangerous or dirty rubbish is wrapped up or packed inside other rubbish rather than spread around.

In one school, five-year-old children noticed that every weekend excess refuse in the dustbins became littered around the school. After asking the school for more receptacles and being told that there were no more available, the children wrote to the town hall and this time were successful. Another group of children approached the town hall to report a particularly dirty site near their school. The council environment officer took heed of their request and the site was cleaned up.

There are many other examples which show that these teaching methods encourage children to act for themselves and to become aware of their own potential influence on the environment.

GENERAL COMMENT

This project, which has been applied on a wide scale from the start, has enabled all participants to offer very practical assistance and has very naturally become part of the national syllabus in the United Kingdom, at the request of the users themselves.

It departs from the traditional principle of the lesson (reading, writing and arithmetic) by basing a sequence of discussions and practical work on the theme of a picture, putting children in direct touch with the practical aspects of everyday life. This leads inevitably to an awareness of the realities which make up our surroundings and of the individual's influence over his own living conditions.

By bringing the class to life, this teaching method encourages it to feel dissatisfied with its relatively abstract seclusion. The children then feel a need to leave the classroom, to become acquainted (in a controlled way) with outside life and to meet its various characters, council officials, fire and police services, shopkeepers, businesses etc.

In this way, a link is established between school and life at the earliest age. Children naturally acquire a basic civic sense, by experience and by critical analysis, through such notions as tidiness, help for the disabled, respect for other people's property, traffic safety and the Highway Code, noise etc, and each individual pupil is given the chance to find his own personal and social motivations.

RESEARCH AT BRIGHTON POLYTECHNIC

In 1973 the Keep Britain Tidy Group sponsored a research project at Brighton Polytechnic to find ways of increasing environmental awareness and responsibility in children of all ages, with particular reference to awareness of litter.

The Learning Kits described in the leaflet accompanying this document have been produced after extensive pilot testing during the past seven years involving over 2,000 children in 58 first and middle schools in England, Scotland and Wales. They encourage the use of the children's physical and social environment as a resource for learning and provide children with the opportunity to experience environmental problems and to realise that individual actions can contribute to their solution.

Over 10,000 of the Kits are now being used in schools and teachers centres in the United Kingdom. They have been translated into the Welsh language and into French, German and Flemish and have been adapted for use in Ireland.

The work of the research project continues with the production of science units for 12 - 14 year olds, the evaluation of the existing kits in use, and the production of further materials for secondary and infant schools. The ultimate objective of the project is the extension of the education programme to cover all age groups.

The project team welcomes comments and suggestions from teachers, either on the present kits or on materials and teaching methods for other age groups.

Please write to:

Cherry Mares
Research Fellow
Keep Britain Tidy Group Research Project
Brighton Polytechnic
Grand Parade
GB - BRIGHTON BN2 2JY

BRIGHTON POLYTECHNIC KBTG Schools Research Project

FIRST AND INFANT SCHOOLS

Full postal address of school

_____

_____

County _____

Code _____

Name of teacher completing questionnaire

_____

Type of school (please delete as appropriate) rural / urban / mixed

Age range of pupils in your school _____

Are you yourself primarily concerned with teaching (please tick) reception class / 6 - 7 / 7 - 8

1. DISCUSSION PICTURES

It is proposed that there should be four or five coloured pictures, 19 x 29 ins. These pictures could be used in a variety of ways.

Please would you

a Tick any of the following objectives which might be appropriate for you in your teaching

b Rank these objectives in order of priority (1, 2, 3, 4 etc) Some objectives may be of equal importance (1=, 2= etc)

	a	b
Stimulus for language development through conversation and discussion		
Stimulus for writing		
Increase awareness, observation and understanding of the environment		
Increase awareness of litter		
Stimulus for creative work		

Are there any other objectives which you would regard as more appropriate than the ones listed? Please state

_____

_____

_____

_____

_____

Questionnaire sent to random sample of 500 teachers in England, Scotland and Wales

Topics

The suggested topics for the pictures are listed below. Please will you rank these topics in order of their relevance to your teaching, ie 1, 2, 3, 4, 5 (or 1=, 2=)

COUNTRYSIDE (shows for example a farm, machinery, animals, children playing, fishing, picnicking, etc) ☐
SCHOOL (playground, a variety of games being played, children looking after school garden, animals, aquarium, school caretaker, etc) ☐
BEACH (children playing, swimming, large and small boats, rock pools, lighthouse, fishermen, birds, etc) ☐
TOWN (shops, vehicles, people, refuse vehicle, street-cleaner, factories, children, ambulance, etc) ☐
PARK (fenced-in flower beds, railings, Keep Off the Grass, children playing, slides, swings, formal garden, play areas, cafe, pond, ducks, dogs) ☐

Please add suggestions for any other topic/s which you would find useful.

Would you like key words overprinted on the picture? YES/NO
Would you like key words for each picture listed with illustrations on separate laminated cards for the children to use? YES/NO
Would you like key words for each picture listed with illustrations adjacent to the picture? YES/NO
Would you like suggested discussion topics and questions for the teacher to ask, listed:- (please tick preference)

adjacent to the picture ☐
beneath the picture ☐
in the teacher's notes ☐
on a separate card ☐
not at all ☐

Would you find these pictures useful with your class? YES/NO
If no, please explain

_____

_____

_____

2. WORK CARDS

We propose to provide sets of work cards linked to each picture. The cards will be laminated and colour coded to match the main picture. Each card will be illustrated with an appropriate image from the large picture.

The objectives for the work cards can be grouped under the following headings
Please would you rank these objectives in the order of their importance for you (1, 2, 3, 4, 5 etc or 1=, 2= etc)

Stimulus for writing and discussion ☐
Encourage reading and comprehension ☐
Encourage the development of mathematical concepts ☐
Encourage an awareness of environmental care and responsibility ☐
Give opportunities for individual work ☐
Encourage an awareness of litter ☐

Would you find the work cards useful with your class? YES/NO

If no, please explain

Would it be necessary to produce different sets of cards for:- (please tick as appropriate)

Beginning readers - Average reading age 5½ - 6½ YES/NO
Reasonably confident " " " 6½ - 7½ YES/NO
Confident " " " 7½ - 8 YES/NO

How many cards would you need in each set (please tick)

under 6 cards	☐
6 to 12 cards	☐
more than 12 cards	☐

Would you prefer banda sheets (or spiritmasters) to work cards? YES/NO
Would you like banda sheets as well as work cards? YES/NO
Any other suggestions

---

3. BOOKLETS

It is proposed to produce two series of booklets, linked to the pictures. These will develop such themes as the work of people concerned with cleaning and waste disposal, the dangers of litter to animals, etc. There will probably be six books in each series, each with one picture and one or two sentences per page. The reading level and vocabulary are controlled as it is hoped that the children will read the books themselves.

Would you find such books useful? YES/NO

If no, please explain

Would you use such books for:-

Individual work YES/NO
Small group work YES/NO

4. SUPPORT MATERIALS

We are thinking of producing further support material linked to the pictures, books and work cards. Although we cannot give an indication of the likely cost, would you please indicate whether in principle you would be interested in any of the following. Please tick:-

Sequencing cards	☐
Simple glove puppets printed on plastic	☐
Fuzzy felt	☐
Games	☐
Puzzles	☐

Any other suggestions?

---

5. COSTS

We would like to know whether teachers interested in using the materials with the children would prefer to be able to obtain them in a complete kit, or as separate items. As this preference is often linked to price, we have given a very approximate price as a guide. The final costs are dependent on the size of the printing run, the cost of art work, the quality of paper etc - factors which have not yet been decided, so the figures are only very approximate.

If you wanted the materials, would you be interested in:-

The complete kit (Teacher's notes, 5 pictures, 5 sets each of 18 cards, set of books)	£11.50	YES/NO
Each picture separately	75p	YES/NO
Each picture plus relevant set of work cards (18 cards per picture)	£ 1.80	YES/NO
Set of 6 booklets*	£ 2.80	YES/NO
Teacher's notes	65p	YES/NO

*Bearing in mind the question of costs - how many sets would you want per class? (Please tick)

1 set	_____
2 sets	_____
3 sets	_____

6. OPPORTUNITY TO PILOT TEST THE EXPERIMENTAL MATERIALS IN YOUR SCHOOL

We intend to pilot test an experimental version of the learning materials as soon as possible, probably in the summer term this year. Would you be willing to help test these matierals in your school? With children of:-

Reception class	YES/NO
5 - 6 years	YES/NO
6 - 7 years	YES/NO
7 - 8 years	YES/NO

7. FURTHER COMMENTS

Although we have looked at a great many learning materials for young children, we are only a small team and it is more than likely that many more materials are available than we have seen. If you know of any learning materials already available which are intended to increase children's awareness of their environment, please would you list them here.

_____

_____

_____

We realise that questionnaires are not a sensitive method of obtaining information and that this questionnaire may not have given you the opportunity to express your views. We would be most grateful if you could write down any further comments you may have about either the overall pattern of this scheme or the individual items listed. Please use extra paper if you need more room.

_____

_____

_____

Thank you very much indeed for your help.

KEEP BRITAIN TIDY GROUP SCHOOLS RESEARCH PROJECT

PILOT STUDY IN FIRST SCHOOLS

A. TEACHER'S NOTES

Did you find the teacher's notes:-

very helpful?		helpful?		unhelpful?	

	YES	NO
Were the notes sufficiently detailed?		
If no, please explain _____		
_____		
_____		
_____		
Were there sufficient ideas for follow up suggestions?		
If no, would you have liked more ideas for:-		
Projects		
Maths		
Science		
Craft		
Movement		
Games		

Any other? Please specify _____

_____

_____

How successful were the following:-	very successful	successful	not successful	did not attempt
the project on litter in the school				
the project on the caretaker				
the project on street cleaning and refuse collection				
the project on packaging				
the maths activities				
the science activities				
the mime and movement				
the games				

Please list:-

Any other ideas: _____

_____

_____

Any particularly useful books you found:

_____

_____

Any other material: _____

_____

_____

Questionnaire sent to pilot test teachers

B. DISCUSSION PICTURE

Which title did you prefer?

The Town		Me in the Town	

Can you recommend an alternative title? _____

To what extent did the picture successfully:	very successfully	successfully	not successfully
- stimulate discussion			
- stimulate writing			
- stimulate creative work			
- encourage observation, awareness and understanding of the environment			
- increase awareness of litter			

How much interest did the children show in the picture?

great interest		considerable interest		moderate interest		no interest	

What do you particularly like about the picture? (if anything)
Please explain _____

What do you particularly dislike about the picture?
Please explain _____

Is the amount of detail:

Too much?		About right?		Not enough?	

Are the figures:

Too large?		About right?		Too small?	

If the following titles were availabe in the same series, would you want to have them?

	YES	NO	RANK ORDER
Me in the Country			
Me at School			
Me on the Beach			
Me in the Park			

Please rank the titles in order of their relevance to your work (1, 2, 3, 4, or 1= etc)

C. WORK SHEETS

Did the children find the work sheets:

very enjoyable?		enjoyable?		moderately enjoyable?	

On the whole did you find the work sheets:

very useful?		useful?		not useful?	

	YES	NO
Are ten different work sheets sufficient?		
If no, how many would you like to have? _____		
We provided work sheets for pre-reading and pre-writing skills, would you also like work sheets for:		
beginner readers		
fairly capable readers		
If yes, do you want work cards as well?		
Do you want the children to write their names on the work sheets?		

Please comment on individual work sheets:

	usefulness			difficulty		
	very useful	useful	not useful	too difficult	just right	too simple
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						

If you made any more work sheets yourself, please explain them briefly.

D. WORK CARDS (red and blue)

On the whole, did you find the cards:

very useful?		useful?		not useful?	

How many work cards would you realistically want available in each set?

5		10		15	

To what extent do the work cards:	very successfully	successfully	not successfully
- act as stimulus for writing and discussion ..			
- encourage reading and comprehension			
- increase awareness of environmental care and responsibility			
- give opportunity for individual work			
- encourage awareness of litter			

Please give the number of the three cards in each set which you found most useful and brief reasons.

3 most useful red _____

_____

_____

_____

3 most useful blue _____

_____

_____

_____

Please give the numbers of the three cards in each set which you found least useful (if applicable)

3 least useful red _____

_____

_____

3 least useful blue _____

_____

_____

Were there any particular skills/areas of interest, not supported by work cards, for which you would have liked work cards? _____

_____

_____

D. (continued) - WORK CARDS

Please state the subject/skill on which you based any further work cards you made yourself _____

_____

_____

_____

_____

Please indicate your views on the:-

Please indicate your views on the:-	inadequate	about right	more than adequate
size of the cards			
size of the print			
amount of illustration			

	YES	NO
Should the cards have full colour illustrations?		
Should the cards themselves be coloured?		

SPAIN

Mr José SANCHEZ MORO
INCIE
Ciudad Universitaria
MADRID

MM I ELORIETA
R TORTAJADA

"Use of plants as indicators of urban pollution".

1. Background to the experiment

1.1 Team

The experiment was conducted by three different types of participant:

- natural science, chemistry, biology and medical students;
- residential groups in several Madrid neighbourhoods;
- a test group of 12-14 year-old children.

Altogether, about 300 families were involved.

1.2 Motivation

The main motivation of the students and the 12-14 year-old children was to have an opportunity to take part in a scientific experiment. A further incentive for the students was the possibility that the work might be recognised as part of their laboratory technique examination in biology.

Motivation factors for the neighbourhood residents (associations) and in some cases for students and children included a desire to learn about environmental needs and a wish to work for the community.

Teachers, on the other hand, seemed more motivated by the possibility of obtaining funds for the acquisition of teaching material, to which they would not have had access in normal circumstances.

1.3 Extra help

- Human resources.

Two bio-ecologists from Madrid University (assistant lecturers in biology) served as co-ordinators for the experiment.

A multidisciplinary team was made up of three histologists, one biochemist, one meteorologist, teachers, representatives of neighbourhood associations, children's parents and experts detached from the municipal technical department.

- Material resources.

Financial aid was obtained from several quarters: A catholic university (private sector) contributed $1,200 for the purchase of equipment and $2,000 for staff costs, while the Spanish Government (CIFCA - PNUMA Research Fund) contributed the sum of $1,200.

A certain amount of equipment was needed, such as a trailer to collect and distribute plants, a plot of land of 100 m^2 in the Madrid suburbs, a laboratory and a classroom lent by the Catholic University, and computing and statistical facilities provided by the monitoring stations of Madrid's municipal council.

2. Educational objectives

2.1 Scientific objectives

- Identifying different kinds of pollution and the areas of Madrid affected.

- Checking theories concerning the effects of different kinds of pollution, within the scope of applied biology.

2.2 Social objectives

- Finding a method of monitoring industrial and commercial activity which is simple to apply, cheap and non-polluting.

- Informing the public and making people aware of their RIGHT to express a view concerning the quality of the air they breathe, instead of blindly delegating full power to the "experts".

3. Methods used - description of the teaching method

3.1 Observation of facts

Selection of survey method after study of scientific press articles. Noting effects of certain types of pollution on plants.

Definition of types of plants to be used.

Seed collection.

Choice of urban survey area and standard exposure conditions.

Soil standardisation.

Plant standardisation.

Setting up test plantations in early June in observers' homes. Instructions on how to proceed and what data to record.

Collection of all samples end summer.

Analysis of observations - findings and conclusions.

At the same time as the test samples were distributed, about 20 observation points were set up to monitor air temperature and humidity with a view to identifying and studying micro-climates.

3.2 Tasks of "pupil" and "resident" participants

Setting up test plants - all facing south-west.

Daily watering at 10.00 pm - 1/4 litre.

Extra watering with same quantity at 10.00 am in the event of temperature exceeding 25°C.

Daily observation and recording of the following phenomena: growth, appearance of leaves, flowers, various spots or damage.

Technical consultation of specialists where necessary, by telephone.

Helping to draft conclusions.

3.3 Tasks of students

Reconsideration of traditional model of analysis.

Use (and design) of monitoring equipment suitable for non-specialists.

Plant selection and sampling.

Organising consultation and study meetings with other participants.

Collating results. Preparation of map of Madrid, showing different types of pollution and their origin and identifying polluting agents (such as CO, NO_x, SO_x, fog).

Assessment and publication of results.

Setting up new observation model.

4. Conclusions

4.1 Evaluation

- Scientific evaluation.

Comparison of findings with those of official municipal bodies and those of other cities.

Confirmation of theories and magnitude of urban pollution.

Comparative analysis of simultaneous experiments on mosses.

- Social evaluation.

Increased interest by local authorities, resulting from findings, even though no precise action may be taken.

Increased motivation of neighbourhood associations, especially those located in neighbourhoods most affected by pollution.

Suggested solutions published in scientific journals by environmentally-minded educationalists.

4.2 Follow-up

- Repetition of the experiment the following year, to refine and confirm results.

- Start of pilot experiment with schoolchildren, eventually abandoned for lack of resources.

- Preparation of new survey model using trees, based on an annual observation cycle, requiring less daily care and offering more resistance to pollution.

4.3 Publications

- Production of four sets of posters and stickers.

- Preparation of a final report and observation notes for the university.

- Publication of articles in two weekly reviews and in several other scientific journals and media.

- Publicity for the experiment (poster campaign, publication of progress reports and findings in the press) facilitating a repetition of the experiment and suggesting shorter and cheaper alternatives.

COMMENTS

Besides checking the physical effects of urban pollution on plants and thereby confirming the existence of the pollution, the experiment's main value has been to induce co-operation between university researchers, students and teachers, children and parents in an open atmosphere and no longer within the confines of the school.

At the same time, constructive contacts were established with a number of municipal departments.

It is important that a clearer distinction should be drawn between the notions of Environment and Ecology (the subject of this experiment), as a means of impressing upon participants, and especially on children, how vast a field of investigation and action is open to them outside school, but with the support of the school system.

DENMARK

"School and working life"
Willy Daniel
Skolevej 3,
2820 Gentofte
Denmark

"... In the last 30 to 50 years, the gap between childhood and working life has widened considerably.

When I was a child, I often used to join my parents in the textile factory and I would be admitted in the cutting and knitting workshops.

The machines, which were hand-operated in those days, were relatively safe. I would often play under the cutting tables. Similarly, on the farms, children would often join in many activities in the fields with their families.

Nowadays, with widespread automation, both in industry and in farming, parents have to keep their children away from potentially dangerous machinery. By the same occasion, the greater distance between the place of work and home, and therefore between the children's school and their parents' factory, has aggravated the lack of contact between childhood and work.

Like us, our youngsters will eventually have to choose a job and take their place in society. Education will therefore have to try to make up for the lack of natural contacts by making a practical and concrete effort to inform.

Children nowadays are no longer familiar with the world of work. The only notion they can acquire is derived from audiovisual reports, the press and - all too rare - visits, arranged on odd occasions by teachers. The limited and abstract nature of such contacts, however, in no way makes up for the process of almost daily discovery, the personal explanations given as questions are asked, or even the handling of machinery under the guidance of a parent or friend ...".

In its regulations, Danish education has tried to respond to this challenge of technology.

Every comprehensive school has a vocational guidance counsellor, who can help teachers organise visits to companies and gather the necessary documentation to prepare and follow up the visits.

In this way, Danish comprehensive schools have been able to make substantial progress in terms of organising and maintaining contacts with industry.

Unfortunately, for lack of time and experience, the introduction to working life has not been so successful.

The general information aspect was satisfactory, but not the learning situations in working life.

The experiment reported here consisted in organising (teacher plus vocational guidance counsellor) two-day "study visits" to the major Diesel motor works B and W Diesel.

The project was divided into three stages:

- Preparation of the visit in school.
- Study visit in the factory.
- Follow-up in school.

PREPARATION OF VISIT

Introductory phase, consisting mainly of preparing WORDS and CONCEPTS related to WORKING CONDITIONS, to facilitate conversation in the place of work.

The teacher is supplied with basic documentation, and is asked to spend one or two days in the factory before the class outing.

The topics covered are very varied:

- Different types of job.
- Financial background of the enterprise (now a subsidiary of a German group, after operating as a purely Danish concern under the name of Burmeister & Wein).
- Conditions of staff training.
- Human, technological, psychological and physical aspects of the factory:
  - human: sex of employees, racial origins, travel to work;
  - technological: development of design and production techniques;
  - psychological: trade union presence and activity;
  - physical: working conditions (assignments, work rates, chemical pollution, noise etc).

A representative of the factory staff was then invited to give two or three talks on these various topics.

A television programme on boats and Diesel engines, followed by a slide show on the different stages of production in the factory, provided a useful illustration of abstract information (similar in presentation to the traditional teaching of a "subject") by offering some preliminary visual impressions, giving an idea in particular of the size of industry.

The teacher, the vocational guidance counsellor and the B and W Diesel staff representative were all asked a great many questions by the children in this introductory phase, ranging from the daily work routine in the factory (what sort of footwear should be worn?) to questions of philosophy and democracy (seniority and pay, for instance).

A few days before the actual visit, students are expected to:

identify the problems they want to deal with and set up working groups;

agree on the work (documents etc) which they want to produce in the final follow-up stage;

identify the material and equipment they will need to use during the factory visit, such as camera, tape recorder etc.

FACTORY VISIT

Students are placed in a REAL SITUATION.

They arrive at the factory at the same time as the workers, which means getting up early, as the time is 6.30 am.

They are allocated a locker in a changing room (one for men and one for women), working clothes (overalls, safety helmet, workshop footwear) and a punch card.

Students are then taken on a preliminary visit for an overall view of the works.

During this very traditional type of visit, they listen, look and take in the new surroundings (smells, noises etc).

Many participants express surprise at this stage, when they discover the "scale" of industry, with its huge motors, assembly lines, etc.

The working groups are then split up, one being sent to a training workshop and the others to production.

It is very important that boys and girls, pupils and teacher, should be immersed in the same conditions of contact and experience. The same reality must be perceived by all participants.

In the age group concerned, there is still no specialisation or streaming. Some of the pupils will later go into training, others to university, but they should all be given the same sense of respect for manual work.

Lunch is taken in the workers' canteen, after which there are discussions with employees working in different positions and different jobs, either in offices or workshops.

A workers' representative then talks about the role of the trade union. Owing to the size of the factory, and operational and economic constraints, problems cannot always be solved on an individual basis.

A militant trade unionist will then give an idea of labour problems on a national scale, suggesting that, in his opinion, they can only be solved with the help of society at large, at a national and even international level.

The second day of the visit is organised along the same lines, with each working group looking at the differenttypes of industrial and administrative jobs and coming into contact with all those involved, apprentices, employees, workmen and managers.

At each stage, the students are given practical experience, either operating machinery or in different sections, such as training, designing, computing etc.

The boys and girls actually handle tools, listen to the explanations of the workmen who use them and compare experience.

A final meeting is then held in the factory. Students are back in their "civilian clothes". They bring up topics which they would like to discuss. For the next two hours, workmen, employees, apprentices and managers answer their questions, which are mainly concerned with the physical conditions of the industrial environment, employment or technological change.

Each working group then drafts a report on the visit and a copy is sent to the factory.

Learning materials are then collated, such as impressions in the form of photographs or sound recordings, books and press articles, drama, current exhibitions in Copenhagen etc.

This type of working visit, which was initiated in 1977, has now been organised on several occasions in different surroundings.

Some 80 teachers have taken part in study groups, and of those some 20 or so have brought together background material to help prepare similar educational projects. The research has been carried out in the Danish Royal School of Teaching Studies. Contributions have been made by many people in industry (employees, workmen, managers etc) and several trade unions (representing employers and workers).

A set of audiovisual documents, with the relevant background material (for students and teachers) is at present being prepared.

In using these working visits to factories as teaching aids, we are preparing students not only for their later choice of career, but also for their later role as citizens and as active members of a democratic society, where the principle of dialogue is instilled in children during their years at school.

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SUMMARY RECORD AND CONCLUSIONS

TEACHING OBJECTIVES

Perception: Imparting practical perception of working life to students.

Work experience.

Contacts, interviews, discussions "in situ" with workers.

Attitudes: Experience of working life is intended to give young people an understanding and thereby a respect for others and for the work they do.

Understanding: The working individual as a historical and social actor.

Which working problems stem from the individual and which are derived from the social structure?

Not all problems can be solved on an individual basis.

Individual participation in the life of a democratic community is a necessity.

PROGRAMME FOR FACTORY OUTING:

PREPARATION

Teachers and students are given preliminary information concerning the company (articles, social and economic data, production, group connections, buildings and equipment, general dimensions).

Introduction of specialised vocabulary relating to the factory, which can be used in conversation on eight topics: work functions, co-operation, finance, training, environment, employment, trade unions and technological development.

One or two-day visit of factory by teacher on his own.

Participation in two or three lessons by factory representative.

Definition by students of themes to be covered during the outing.

Selection of three working groups, each with a particular theme.

Choice of presentation of results.

Identification of equipment required for study outing.

STUDY OUTING

Arrival at factory at the same time as workers.

Allocation of working clothes, safety helmets, check-in cards, lockers.

General group visit round factory to obtain an impression of physical surroundings.

Contacts with working life: encounter with workers and work.

Conversations, interviews, and dialogue with workers - practical work.

Following a typical worker (2-3 students).

Interview with staff representative (6-8 students).

Interview with foreman (6-8 students).

Interview with sales or planning staff (6-8 students).

Interview with apprentice in workshop (2-3 students).

Interview with office apprentice (2-3 students).

Handling of tools and machinery.

Final meeting at factory with staff representatives, apprentices and company managers.

FOLLOW-UP IN THE CLASSROOM

Teacher and students have lived through the same experience, but have not had the same impressions, owing to different attitudes, a different personal background, different past experience etc.

These concrete impressions and the shared experience should provide the starting-point for more abstract reflection, for generalisation based on common experience.

Introduction of terms with a political content, such as "compulsion" or "solidarity".

Final meeting in the classroom with a workers' representative.

Drafting of report which is sent to the factory.

Completion of documents illustrating the report, such as photographs, recordings etc.

Search for supplementary material, such as books, newspapers, drama, exhibitions etc.

./.

EVALUATION

The following reactions are generally observed among participants:

STUDENTS: entirely positive reactions, from the point of view of discovering both people and work methods. Connection of theory and fact (effect of noise on hearing, relating smells to abstract notion of pollution etc).

FACTORY REPRESENTATIVES:

"Newspapers and television give the impression that young people nowadays do not know anything and are not interested. I have found that this is not so."

"Their questions make us reconsider our ready-made answers."

TRADE UNION REPRESENTATIVES: "Study outings to factories will give students a better awareness of public opinion concerning environmental issues and working conditions."

EMPLOYERS' REPRESENTATIVES: They foster awareness of the economic needs of the firm and the connection between all the measures taken to protect the environment and to improve working conditions and cost.

TEACHERS: Discovery of close contact with factory life, a new personal experience, bringing "life" into their abstract teaching.

As a result of the outings, they often use terms and references connected with the outing in the course of their teaching.

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A factory visit is not only a way of informing young people about possible careers, but it also helps to motivate them to act IN and ON the environment, through greater participation in the life of the community.

The objective is to encourage students to think about the type of problems which arise in a factory, whether they are of an individual nature or whether they require general solutions.

Comparing teachers' and students' impressions can provide a starting-point for reflection.

The topic of trade unionism (compulsion, solidarity) is dealt with at a special meeting in class with a representative of the workers.

COMMENT

The main purpose of the experiment is:

- to make students aware of the relations between the individual and the community;
- to give them an idea of the problems of working life;
- to prepare them for a choice of career.

The scope can be considerably extended, if observations made within the factory are used to improve students' knowledge of different subjects on the basis of observed facts.

For instance: motors are made of steel and are run on a by-product of petroleum, fuel oil.

These facts can provide a direct introduction to various subjects, such as:

- geology (ore and petroleum),
- physics (characteristics of steel and petroleum),
- chemistry (petrochemicals, manufacture of steel),
- economics (industrial activity and GNP).

Company management is computer-assisted, for payrolls, accounts etc:

- computers (design, development, manufacture, use);
- practical work on terminals;
- payroll (wage components, insurance deductions, percentage paid by employers and employees, etc);
- accounts (profits, investment, loss, bankruptcy ... mathematics).

Every visit can be followed up with reports, and every factor of experience, in the factory or in the street, can be related to the different "subjects" which constitute traditional teaching, making it more lively and more attractive, thanks to direct contact with reality.

Anything which is seen, experienced or touched by the students can provide a starting point for "live" teaching, indirect contact with facts which have been observed and discussed. This encourages each individual to determine his own level of responsibility and his own (present and future) influence, that is, how he can act "in" and "on" the environment.

FRANCE

Report on teaching experiment
Lycée d'enseignement secondaire Jean DURAND-CASTELNAUDARY
Mr Roger MAGUER, Teacher
KERMOUSTU LEZARDRIEUX
11400 VILLENEUVE LA COMPTAL

This project is a follow-up to teaching research carried out at the Castelnaudary Lycée from 1971 to 1980. (Initiation au monde contemporain par les Sciences Sociales avec analyse prospective de l'Environnement - Issues No. 98 and 109 of "Recherches Pédagogiques - INRP", 1979 and 1981.)

In 1979-80, the Lycée Jean Durand of Castelnaudary allocated a week of class-time in form 1B to:

- carrying out a field study of a natural wind site in the municipality of Villeneuve la Comptal in the vicinity of Castelnaudary;
- taking part in the work of the municipality's Land-use Planning Committee.

In 1980-81, this was followed up with a plan to restore a ruined windmill, involving four forms, 2A, 2B, 1B and 1C.

1979-80

A. Study of the wind site at Villeneuve la Comptal (Form 1B)

Study of statistics supplied by JOUDES Experimental Farm.

Study of wind generator operation.

Wind measurement.

Construction of wind generator models.

B. Preparation of an alternative municipal land-use plan (Form 1B).

The original land-use plan provided for a ridge road over the line of hills and new building projects.

The new plan, based on the decision to restore the mill and bring it back into operation, has led to the classification of the area as agricultural (non-building) land, then to further development of the site as a leisure park for the inhabitants of Villeneuve la Comptal.

1980-81

Implementation of land-use plan and restoration of the mill to full working order.

Strengthening of foundations - partial reconstruction of walls - re-roofing - manufacture and assembly of vanes, with the objective of setting up in the mill:

- a wind laboratory;

- electricity generation, to fill an elevated reservoir with water (brought by two further windmills). The reservoir would be used for:

  . the storage of energy in kinetic form;

  . irrigation and reforestation of the hill and area around the windmill.

As well as the second and first forms of the Lycée Jean Durand of Castelnaudary, the project was big enough to involve the masonry, electricity and metallurgy departments of the Technical College and the landscaping department of the Agricultural College, both of Villeneuve la Comptal.

A lot of outside help was needed to carry out the necessary surveys and work:

- Town hall authorisation to allow students access to land-use plan committee work;

- Material aid from the municipality in the form of tools, manpower, funds;

- Assistance of the works and agriculture divisions of the département to have mill area and surrounding hills reclassified as an agricultural zone;

- General Council subsidy;

- Direct assistance by outside enterprises:

  . difficult design and assembly work on structures and vanes,

  . loan of equipment and staff for transport of students and equipment, scaffolding,

  . legal advice for the purpose of setting up a 1901 Association and drafting a long lease on the privately owned mill area,

  . material aid and technical advice provided by the National Railways and the Electricity Board,

  . assistance provided by local craftsmen and pensioners for different tasks, design work and planning,

  . pooling by the various schools and colleges concerned of overtime allocated as part of an approved Educational Cultural Activities Project (PACTE),

  . multidisciplinary work by teams of teachers and students (manual work carried out by students of the Lycée d'Enseignement Général under the supervision of specialised staff from the technical college etc),

- co-ordination of three educational establishments, attached to two different ministries, for joint educational projects and practical work,

- assistance of outside specialists, both in the field and during the preparatory stage.

By end 1981, a lot of work had already been done on repairing access paths and restoring the structure of the mill (strengthening of foundations, high support band for vanes, strengthening of walls).

Work on the wind vanes (wooden mould of model) and technical studies on vane design and the use of wind energy and its storage (in the form of kinetic energy) are also well advanced.

The remaining work (storage reservoir, assembly of vanes after manufacture, detailed design of working system, irrigation network and reforestation) will be continued in 1981-82 in the form of an INRP research project on energy teaching, run jointly with the Electricity Board and the Ministry of Industry.

ASSESSMENT

Objective: learning to act IN and ON the ENVIRONMENT.

Traditional (test of knowledge)

Economics and geography homework was based on the practical work of the project (eg mapping site, costing works and general budgeting).

Homework was marked on a letter scale from A to E.

The normal pattern of performance often changed, as many students showed up better in a less abstract atmosphere, and there was an improvement in the overall standard (motivation).

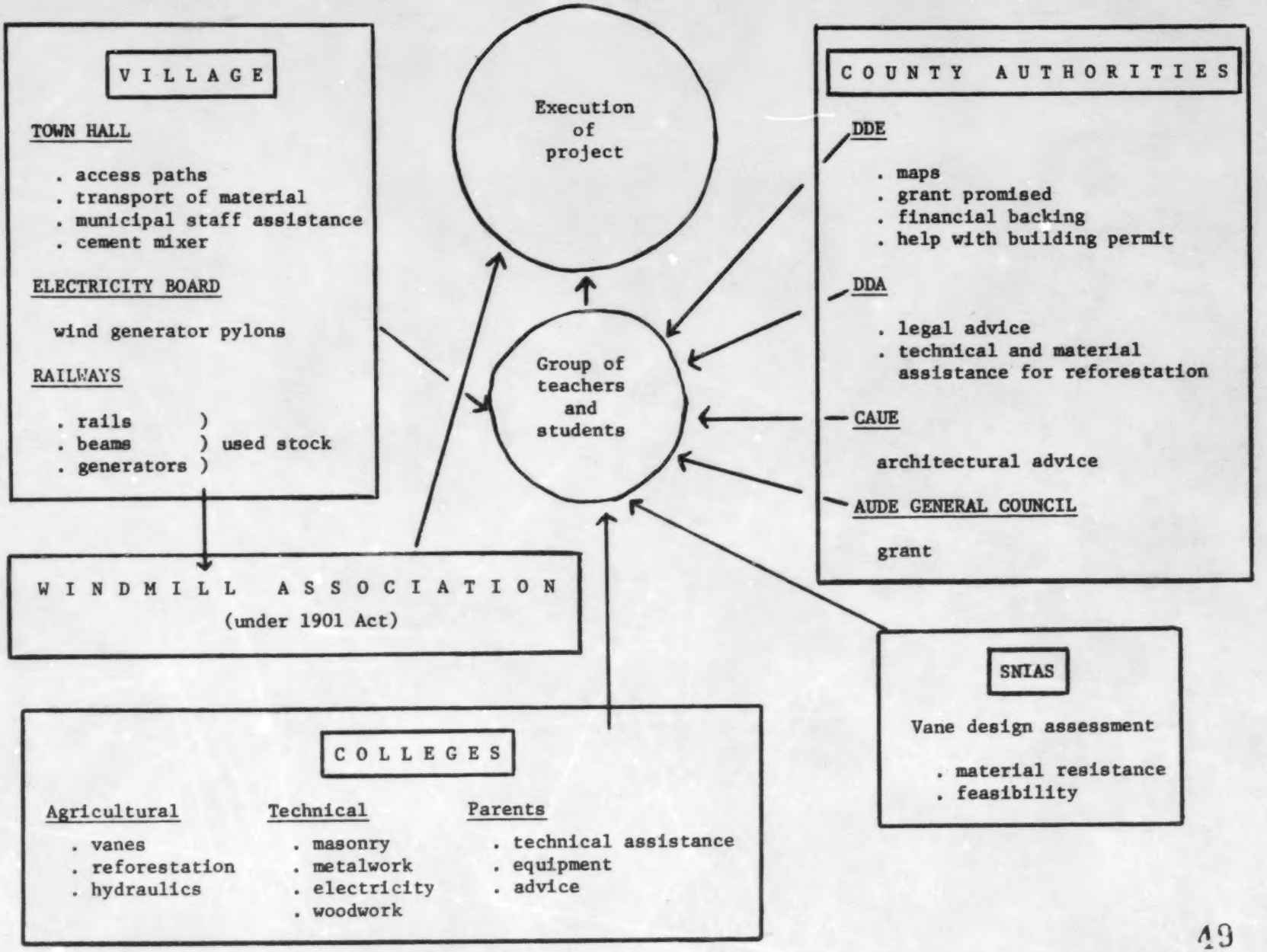
Quantitative

The school changed from its usually passive role to an active approach and very soon produced concrete and tangible results, with the combined efforts of teachers, students, the public and various administrative bodies.

More than 200 pupils from three different schools worked together on a joint, self-managed project under the guidance of groups of teachers. About 12 different firms and local, regional and national government offices provided information and support. In other words, the school became outward-looking.

Qualitative

By observing and charting the behaviour of students in relation to the stated objectives (see Recherches Pédagogiques No. 109, pages 70 to 85), it was possible to refine the educational strategies involved. A national course for human science teachers (1st cycle) used the project as an illustration for further training in June 1981. (It was unfortunately not possible to produce the CNDP film as planned owing to the fact that the group of teachers and students could not agree with the producer in charge of the film on an appropriate scenario.)


VILLAGE
TOWN HALL
. access paths
. transport of material
. municipal staff assistance
. cement mixer
ELECTRICITY BOARD
wind generator pylons
RAILWAYS
. rails)
. beams) used stock
. generators)
Execution of project
Group of teachers and students
COUNTY AUTHORITIES
DDE
. maps
. grant promised
. financial backing
. help with building permit
DDA
. legal advice
. technical and material assistance for reforestation
CAUE
architectural advice
AUDE GENERAL COUNCIL
grant
WINDMILL ASSOCIATION
(under 1901 Act)
SNIAS
Vane design assessment
. material resistance
. feasibility
COLLEGES
Agricultural
. vanes
. reforestation
. hydraulics
Technical
. masonry
. metalwork
. electricity
. woodwork
Parents
. technical assistance
. equipment
. advice

Institutional

It was noteworthy that combining the efforts of three different educational establishments (general, technical and agricultural) attached to two different ministries had the effect of enhancing their separate capacities.

Practically all the operations, including design, assembly of resources and execution, were carried out jointly, or at any rate on the basis of joint decisions, by schools, teachers, government officials, firms and parents, leading to a form of symbiosis uniting the efforts of traditionally separate agents for a common end.

COMMENT

There is a feeling that the teachers of the various schools and colleges concerned (general, technical, agricultural) might have put more effort into the project and made more general use of different topics as they emerged in the course of operations.

For the students of the Lycée Jean Durand, the subjects involved were:

- history and geography,
- natural sciences,
- introduction to economic and social facts,
- physics,

with equal participation by the teachers concerned.

Some contribution was made by teachers of economics, English, philosophy and mathematics, but in these cases only a superficial interest was shown, whereas the introduction to local government, contact with firms or the General Council in fact provided suitable topics for any part of the syllabus.

On the other hand, the process of symbiosis became firmly established between the school and the outside world, more so than within the educational world itself. This shows the need to train and inform teaching staff, in order to release the school from its historic isolation (see introduction to the colloquy by the Inspector General, Mr GOURLAOUEN).

THE OUTWARD-LOOKING APPROACH AND ARCHITECTURE

Considerations on the need for a new spatial design for schools

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The question is whether the new outward-looking approach to teaching should not influence the design of school buildings.

Over the last ten years, office design has evolved, first with landscaping, then with modular spaces, for the purpose of facilitating internal communication at work and to introduce new human relations, new technical resources and new ways of organising work.

In spite of all the changes which have taken place in teaching methods, and in spite of experiments conducted in Europe, it seems that no real effort has been made to rethink the traditional model of school buildings.

There may be cause to wonder that primary school classes which have so far operated on the basis of

- unity of time (fixed daily timetable),
- unity of place (an enclosed classroom in an enclosed school),
- unity of people (teacher and pupils, all day long and all year long),

and secondary school classes, which operate on an altogether different system (different teachers, different classrooms, different sets of students distributed according to subjects, irregular timetables), should still have to make do with one and the same type of architectural design, namely standardised classrooms arranged as a uniform set of closed box shapes along a corridor.

According to the standards laid down by the education authorities, there are at least two constraints which must apply to all school buildings:

- a certain minimum area per pupil,
- a maximum cost per given area.

To these normal constraints are added:

- national rules of safety and hygiene,
- town planning regulations applied in general and to specific sites.

Some countries, including France, have taken standardisation a step further with model designs, adapted according to the level of teaching and the capacity of individual establishments (number of classes in infant schools, 1,200 pupils in secondary schools (CES)).

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Although this has made it possible to rationalise alternatives, to use industrialised building methods and to save on costs, it seems to have had a negative effect on creative design.

A school, like any functional building, must be a work tool. If requirements change and if the form of teaching and the people involved in it also change, then it would be preferable to think in terms of a design facilitating mobility and variety and an outward-looking approach.

As it has been said in all the reports which constitute this document, school and the classroom can no longer be closed units, carefully isolated from the outside world.

In order to accommodate working groups, exchanges between classes, outside participants, outings, documentary research, practical work, audio-visual activities etc. school buildings must be designed to provide a flexible use of space and communication facilities, with some areas in common and others set aside for interviews, and some places where the individual can withdraw on his own.

Nevertheless, it is not up to the architect, however imaginative and talented he may be, to decide what form teaching should take. He must be provided with the necessary data, constraints and objectives by the users themselves, ie teachers, children and parents.

In other words, the designer must offer the type of buildings which are suited to the new requirements of teaching.

It is therefore essential that educational teams should express their needs, in the form of a programme, which can then be submitted to the architect (allowing for competition among a number of designers) and which can be used as a "reference bible" throughout the design stage, thus providing a means of assessing the proposed solutions and adjusting functional choices in accordance with inevitable cost and town planning constraints.

In order to emphasise the essential part played by educational teams in the approach to design based on a programme, we would like to illustrate the views of the various partners (educational teams, programmers, architects and engineers) by presenting a project showing the link between programme and concept.

Just as it has been necessary for economic reasons to reconsider the technical design of many buildings (to save energy), it is also worth reconsidering our attitudes in relation to this new expression of teaching requirements.

REQUIREMENTS EXPRESSED IN A PROGRAMME

The programme should:

- express the needs of users;
- define the requirements to be met by:

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. buildings,

. equipment,

. use of buildings and equipment;

- allow the project to be tested for suitability at any time in relation to objectives (eg by comparing architectural designs at the competition stage, then at the design stage, as a means of excluding architectural and technical alternatives with undesirable effects on the use of the buildings).

Furthermore, throughout the programme study stage, the programming team should

- institute procedures for co-ordinating the work of different contributors, in order to ensure the coherent progress of the studies, including the main responsible body (the future owner of buildings), the programmer, designer (architect and engineer), works contractor (firms) and end users (educational authorities, teachers, children);

- call for and edit the required data.

In view of the progressive nature of programming studies and of the variety and complexity of the problems involved, two kinds of programmes are needed:

- an <u>educational and operational</u> programme, containing general data related to operation and use;

- an <u>architectural and technical</u> programme, giving a quantitative and qualitative indication of objectives.

In order to facilitate the implementation of a programme in the case of particularly complex buildings, it may be advisable to add a <u>specific programme</u>, detailing objectives and constraints specifically related to particular functions, activities or premises.

We would like to illustrate these two types of studies by referring to the project of the Ecole St. Merri in Paris (rue St. Merri - rue du Renard - Paris 4).

<u>EDUCATIONAL AND OPERATIONAL PROGRAMME</u>

The design of the buildings is entirely based on a new teaching approach: open teaching.

"Open-plan architecture (there are no more closed-in classrooms in this school) is only worthwhile if it genuinely symbolises the decompartmentalisation of the content of education."

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This statement, which is taken from the school Charter, appended to the school rules and approved by the School Council, clearly illustrates:

- the different teaching approach;
- the notion that the architecture of buildings should be nothing more than a means of producing a work tool.

Content of the programme:

- Rehousing of two primary schools (630 children) and one infant school of seven classes;
- Site: 2,800 m^2 of land in the town centre, in the immediate vicinity of the Centre National d'Art Contemporain Georges Pompidou - a very noisy neighbourhood;
- Besides the schools, the buildings must also house a number of neighbourhood activities and continuous training courses, which have not been included in the present study since they are not strictly relevent to the matter in hand.

Teaching objectives:

- Respect for the child's personality;
- Development of independence and initiative;
- Co-operation;
- Outward-looking approach;
- More personalised approach to teaching, allowing each child to progress at his own pace;
- Better use of teachers' aptitudes and interests;
- Consultation among teachers, team work;
- Very flexible use of space and time;
- Opportunity for individual work;
- Variable division of classes into groups in different teaching stages according to:
  - children's basic needs,
  - individual learning potential,
  - pace of activity,
  - degree of sociability.

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The educational cycle is based on three reference stages:

1. 2-5 years - lower and middle infant school.

2. 5-8 years - upper infant school, CP and CE1.

3. 8-11 years - CE2, CM1 and CM2.

Each group of children is looked after by a team of three or four teachers. Groups are divided according to proposed activities, the children being admitted at their own request, which will foster the independence of each child in relation to and within an active "workshop" teaching system.

The teaching team will normally follow its group of children through the three teaching stages, with at least two members of the team providing continuity, allowing for transfers, appointments or personal factors among the teachers.

Half a teaching post is assigned to helping children who are behind, at any level of schooling (half-time attendance).

The school is provided with a gymnasium, for individual or team sports, such as gymnastics, dancing, volley-ball or basketball.

The buildings will include a swimming-pool for teaching children to swim, training or recreation.

A lot of time is given to practical work, such as pottery, growing plants, traditional handicrafts, painting, cutting out, gluing, drawing. A reprography service is generally available for free use in all teaching areas.

A communal canteen, a co-operative (run by pupils, who elect their own representatives, teachers and parents) and a library (open full-time with a librarian/documentalist in charge) provide socially and educationally oriented ancillary facilities.

The Educational and Operational Programming Study, prepared by representatives of teachers', pupils' and parents' committees, under the guidance and supervision of a specialised programming team, includes:

- A list of the various activities and functions to be catered for:

  . reception (public, children),

  . main functions (quantitative and qualitative explanatory presentation of the different stages of the educational process),

  . subsidiary functions (practical work, ancillary premises/ restaurant, library, documentation),

  . sport (swimming-pool, gymnasium),

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. recreation (indoor and outdoor),

. miscellaneous functions/ancillary premises (stores, offices, social services, residence, security, workshops, technical units etc);

- Operational data (timetables, access and movement, capacity, with full operational description of each activity);

- Movements of persons and goods.

All this information is presented in the form of tables, diagrams and charts, with appropriate comments.

There is a visual display diagram illustrating connections between premises (flow direction and intensity), distinguishing between persons and goods.

This is accompanied by a time schedule of the use of facilities.

Wherever necessary, there are indications of the qualitative, quantitative and functional constraints relating to the new teaching techniques.

The MOBILITY of working groups (in terms of both movement and composition) and the automatic intercommunication between teaching teams are the two most important aspects of the system and those which will most affect architectural and technical choices.

ARCHITECTURAL AND TECHNICAL PROGRAMME

This phase of the Programming Study consists in:

- Estimating the areas required for the above-listed functions;

- Deciding how the facilities can be integrated in the life of the neighbourhood;

- Indicating environmental requirements:

. visual communication or separation between school and streets,

. exposure to sun,

. pollution;

- Noting whatever town planning and architectural regulations apply to the site;

- Noting whatever rules and regulations apply to different types of premises (safety, hygiene, access for the disabled);

- Defining the standards of performance and service required of the general technical facilities of the buildings and localised equipment (daylight, artificial lighting, temperature and artificial ventilation, floor loading, minimum height, dimensions of entries and exits, electric power, luminosity, telecommunications, sound insulation etc).

If there are many highly specialised premises or functions, it would be preferable to add a specific programme, which would later facilitate the use of documents and information by offering a more practical form of classification:

- architectural and technical programme giving general information classified according to function;

- specific programme giving qualitative and quantitative characteristics of individual premises.

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In the case of the Ecole Saint Merri, the designer came up with the following answers to the programme specifications:

EDUCATIONAL AND OPERATIONAL PROGRAMME - ARCHITECTURAL SOLUTIONS

The school may be integrated in the neighbourhood in the following ways:

- By extending pedestrian access from outside pavements by means of a ramp to the internal school circuit, towards the basement and sports facilities and towards the other floors housing the three different teaching levels, allowing easy access for disabled people (with optional lifts) and improving the safety of children by eliminating stairways.

- By providing direct access from the pavement to the entrance hall and to sports facilities (the pavement is led into the school grounds, forming a protected walkway giving on to the main hall and the ramps). Communication is facilitated by an appropriate design of spaces and transparent panels.

- By providing a number of outside terraces linked together by ramps, which can be used for games and recreation (2,300 m^2) and emphasise the link between the school and its surroundings. Access is also provided to a non-constructible area between two buildings converted into a garden.

- Teaching areas inside the school are left completely open. Areas are left available for working groups to arrange. They are inter-connected and situated around "common facilities", which may themselves be either closed off or not according to their purpose (toilets, projection room, photographic room, reprography, pottery, water supply etc).

- By closing the side of the school giving on to the street (source of noise and pollution) and by leaving the teaching areas open to the ramps and inner courtyards (facing south). The ramps themselves provide a sheltered passageway between the teaching area and the games areas (floors lined with plastic to reduce sound and injuries from falls). Street fronts are all glass and may be covered.

- By locating occasionally used premises, such as canteen, social facilities, offices, storerooms, meeting rooms etc, on the first floor (the ground floor being used for access, courtyard and general movement), which is the least lit and the most exposed to street pollution, with the upper teaching group on the second floor, the middle group on the third floor and the youngest children on the fourth floor, which is the sunniest and quietest.

ANSWERS TO ARCHITECTURAL AND TECHNICAL PROGRAMME

- Overall air conditioning, in view of noise and pollution produced by the streets (ventilation at ambient temperature plus optional heating).

- Variable division of teaching areas with movable partitions, easily movable low partitions and storage furniture used as screening.

- Sound insulation and acoustic protection with low ceiling panels and wall-to-wall carpeting.

- Provision of "sheltered areas" for individual work or personal interview.

- Remaining inner walls and columns left in bare concrete, for free information display or ornamental painting by pupils, easily renewable over time.

- Furniture designed for:

  - variable assembly (trapezoidal tables) adaptable to different groups and activities and allowing partial partitioning;

  - easy maintenance (washable, coloured melamine tops providing a functional and decorative element, allowing seats to be fastened to the edge and raised for floor cleaning);

  - easy handling by children (light, strong, easy to grasp, modular units).

- Teaching areas equipped with water and electricity points for use during activities.

- All floors in areas used for practical work lined with plastic for easy maintenance.

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It is essential that such premises should be visited by the designers and by those responsible for the future use of the buildings (teachers, educational authorities, local councillors who commissioned the work), so as to ensure an increasingly outward-looking approach in the school.

Information concerning France may be obtained from the following organisations, which will provide details about current projects:

- Ministère de l'Urbanisme et du Logement, Direction de l'Architecture, 2 bis avenue du Parc de Passy, 75016 PARIS.

- Ministère de l'Education Nationale, Direction des Equipements et de la Construction, 142 rue du Bac, 75007 PARIS.

- Mission Interministérielle pour la Qualité des Constructions Publiques, 9 avenue Albert de Mun, 75016 PARIS.

- Ministère de l'Environnement, Direction de la Qualité de la Vie, Mission Formation, 14 Boulevard du Général Leclerc, 92201 NEUILLY sur Seine.

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POST-FACE

"The environment at any given moment consists of the set of physical, chemical, biological, social and economic factors which may have a direct, immediate or delayed effect on living beings and human activities."

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"Environmental education is based on an outward-looking approach in schools, aimed at giving all young people the chance to discover and understand their environment."

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Environmental education cannot be considered to constitute a separate discipline in itself.

All the disciplines traditionally taught in school are concerned with the environment, that is, with life.

Environmental education is partly:

a way of testing acquired knowledge against the realities of the outside world;

and partly:

the acquisition of a form of behaviour which is aware of and accepts responsibility for all environmental factors;

a study of and search for solutions to environmental problems.

The teacher is no longer the sole dispenser of knowledge; his function includes placing the child in touch with the outside world.

To make this change possible, it is necessary to adopt an outward-looking approach in schools based on:

an educational team, drawn from several disciplines, calling on outside contributors as early on as possible, working more by system analysis than by a study of separate disciplines.